

WATER SUPPLY SYSTEM MANAGEMENT PLAN CHECK LIST

Comments Received From:

DEM _____
DOH _____
DOA _____
DPU _____

LEGISLATIVE MANDATE:

Rhode Island General Laws Title 46 Waters & Navigation, Chapter 46-15.3 Public Drinking Water Supply System Protection

The objectives are: To insure that water supply system management plans are prepared, maintained, and carried out by each municipality and by each municipal department, agency, district, authority, or other entity engaged in or authorized to engage in the supply, treatment, transmission, or distribution of drinking water, and that the said plans and their execution achieve the effective and efficient conservation, development, utilization, and protection of this finite natural resource in ways that meet the present and future needs of the state and its people.

8.00 Plan Contents

- Plans shall be prepared in the format regularly used by the supplier for other reports.
- Plan shall include an Executive Summary.

8.01 Goals Statement [Chapter 46-15.3-5.1 (a) of RI General laws]

a) Stated goals shall promote effective and efficient;

- Conservation _____
- Development _____
- Utilization _____
- Protection of the states' surface and ground water resources. _____

b) Goal statements shall be;

- Consistent w/comprehensive plans of municipalities & State Guide Plan Element 721 _____

8.02 Water Supply System Description [Chapter 46-15.3-5.1 (b) of RI General laws]

a) Organization and Legal Structure:

- Description _____
- Owner _____
- CEO _____
- Director or agency head _____
- Board of Directors _____
- Organization Chart - Mgmt & Operation _____
- Each mgmt. Position - major responsibilities _____
- Describe legal basis _____

b) System Overview

- System components _____
- Functions _____
- Relationships _____
- Recent improvements _____
- Schematic Drawing of _____
- Water supply sources _____
- Infrastructure components _____
- Transmission lines _____
- Treatment & storage facilities _____
- Pump stations _____
- System interconnections _____

c) Supply Sources

- Listed, mapped, description _____
- Surface & groundwater supplies _____
- Operating status of each supply source _____
- Abandoned (existing info) _____
- Active _____
- Emergency _____
- Temporarily Inactive _____
- Discussion (regions) of each _____

1) Surface Water Sources

- Location of - _____
- Source _____

- Intake structures _____
- Impoundment & watershed _____
- Water supplier owned land (mapped to scale) _____
- Description of
 - Impoundment _____
 - Surface area _____
 - Size & Elevation of intake _____
 - Stage storage curve or table _____
 - Total & Usable storage capacity _____
 - Watershed acreage _____
 - Existing or proposed minimum downstream discharge rates imposed _____
- For systems w/multiple impoundment's
 - Note function of reservoir - as distribution or storage w/description of relation of components _____

2) Groundwater Sources

- Location of wells, principle aquifers, recharge areas and owned lands mapped _____
- Description of Well _____
 - Type/location _____
 - Depth/diameter _____
- Pump _____
 - Type _____
 - Age _____
 - Remaining useful life _____
- Well _____
 - It's rated capacity and head _____
 - Screen length and depth of screen from the surface _____
 - Slot size _____
 - Casing material _____
- Monitoring program _____
 - Sampling locations(include monitoring wells) _____
 - Type of data collected (include measured parameters) _____
 - Frequency of monitoring _____

c) Infrastructure Components

- Listed _____
- Mapped _____
- Description of each _____

- Pressure zones depicted on map _____

1) Treatment Facilities

- Name _____
- Location _____
- Sources treated _____
- Treatment-type available _____
- Design flow _____
- Emergency provisions(description)
i.e. (energy generators, chemical feed by passes) _____
- Disposal of filter backwash(description) _____
- Treatment tank sludge & disposal site(description) _____

2) Storage Facilities

Describe the following;

- Name _____
- Location _____
- Usable volume _____
- Age _____
- Condition _____
- Date of last inspection _____
- New storage facilities-constructive material, interior
paint coating or lining, cathodic protection _____

3) Pump Stations

Describe the following:

- Name _____
- Location _____
- Capacity _____
- Number of stations _____
- Related hydropneumatic storage tanks _____
- Emergency power provisions for each _____

4) Transmission Facilities

Describe the following:

- Type of pipe _____
- Length _____
- Diameter _____
- Age (actual year installed to nearest 10-year increment)_____

- Condition
- Leakage & repair history

e) Interconnections (All available-permanent/emergency)

- Listed
- Mapped
- Operational parameters (explained)
- Frequency of use (quantity)
- Capacity
- Condition
- Pumping facilities (describe)
- Requirements of: legal _____ technical _____ financial _____
- Hydraulic or contractual limitations
- Contract summaries for purchases and sales

f) Service Area (All available-present/planned extensions)

- Description
- Mapped
- Legally defined area to be served
- Eligible areas to be served
- Water services - present & historic
- Present population served
- Present population not served but eligible to be served
- Population distribution patterns & demographics (CCP's)

g) Metering (describe)

- Extent
- Reading
- Testing
- Calibration
- Repair/replacement
- Location of (masters mapped)
- Extent of distribution % of total connections
- Major users
- Age
- Current programs for above
- System specific characteristics affecting longevity

h. System Production Data

- Current and historical data
- Changes over time
- When occurred
- Volume withdrawn/source/and total sys.

- Current yr. _____
- Historic _____
- Gallons/monthly & annual _____
- Volume bought & sold/other supplier _____
- Gallons/monthly & annual _____

i) Water Use Data (current and historic)

- Changes over time _____
- Describe changes and when _____
- Impacts water saving devices- methodology for assumptions _____
- Water Use data has:
 - Per capita - monthly & annual _____
 - Maximum daily demand- if available _____
 - Such as Peak hour _____
 - Historic-annual OK _____
 - Peaking factor MDD/ADD _____
- Water use analyzed user category (SIC) _____
- Major users _____
- Describe legal obligations and amounts _____
- Estimate-evaluate
 - Fire Fighting _____
 - Non-Account (including system use-unmetered public use) _____
 - Meter inaccuracies-major leaks (annual basis % of water produced) _____
- Water Conservation Programs (describe) _____
 - Impact of saving devices on per capita-by user category (Assumptions and Methodology) _____

j) System Deficiencies (summarized)

- Needed improvements _____

8.03 Requirements of the Water Quality Protection Component

[Chapter 46-15.3-7.3 of RI General laws]

a) Supplier sells more than 50 million gallons per year than a water quality protection

Component must be completed which at a minimum includes:

- 1) Delineation of source water protection areas _____

i) Groundwater systems - delineation in accordance with accepted methods under State's approved Wellhead Protection Program.
(To include non-contiguous recharge areas) _____

ii) Surface water systems - delineation must include entire watershed area upstream of the intake structure. (To include diverted waters) _____

iii) Groundwater/Surface Water Interface - when delineating consider Impacts of groundwater on surface water - may include surface water contribution areas _____

2) Inventory of significant potential sources of contaminants of concern in each source water protection area. _____

i) Contaminants of Concern

Must include:

- Those regulated under the Safe Drinking Water Act _____
- Contaminants with a maximum contaminant level _____
- Contaminants regulated under the Surface Water Treatment Rule _____
- Microorganism Cryptosporidium _____
- Contaminants the DOH has determined may represent a threat to public health _____

ii) Significant Potential Sources _____

Inventory to include:

- Description of sources of contamination by location either specific or by area. _____
- Appendix A _____

iii) For known or potential sources of contamination that are isolated to a limited number of locations;

- Identify names and addresses _____

For those that cover large areas and multiple landowners;

- Identify geographic area where located _____
- Mapped _____
- Current zoning and land use _____

* If copper sulfate or other algaecide is applied than describe;

- Their tributaries _____
- Frequency _____
- Amount of applications _____

3) Determination of Source Water Susceptibility

i) For all new sources of contamination to the water source _____

ii) Describe:

- How results of the susceptibility analysis identifies sources of contamination of the public water supply _____
- How significant the threat is _____
- Relative threat of contamination between sources within the source water protection area _____

4) Describe;

- Present and past efforts to protect water quality both _____
- regulatory and non regulatory _____
- Public education initiatives _____
- Land acquisitions _____
- Acquisition of buffer zones _____
- Diversion and/or treatment of storm waters or spills _____
- Desirable land use control regulations _____

5) Identification of protection strategies

- For protecting surface or groundwater quality _____
- Include strategy for public education that fosters WQP _____

6) Implementation strategy for the above to include;

- Discussion of problems _____
- How they will be resolved _____
- Priority list of actions _____
- 5 year implementation schedule _____
- Description of ongoing efforts _____

7) Document efforts to coordinate implementation recommendations with municipal officials or land use governing boards (documented) _____

8) Reference of approved Wellhead Protection Plan _____

9) Items listed as 2(ii), 2(iii) and 3(ii) are optional for any updates
(Required susceptibility determination for all new contaminant sources) _____

8.04 Supply Management [Chapter 46-15.3-5.1 of RI General laws]

Descriptions for the 5 and 20 year planning periods shall include:

8.04(1) Anticipated Future Demands; [Chapter 46-15.3-5.1 (f) of RI General laws]

a. Future demands for 5 & 20 year planning periods described

1. Estimates of:

- Population change _____
- Economic development _____
(Related to planned extensions) _____
- Based on existing & future land uses [CCP(s)] _____
- If supplier more than 10% estimate difference (explain) _____

2. Estimates of:

- Future wholesale customers _____
- Expansion due to merger _____

b. Legal obligations to provide water

- Intended users _____
- Amounts required _____
- Contract duration _____

c. Projected future water use or demand by user category:

- MG/year _____
- Average daily demand (annual basis) _____
- Maximum daily demand _____
- Proposed conservation measures on future demand _____

d. Major users by year _____

d. Reasonable estimation and evaluation of:

- Fire fighting _____
- Non-account (system use, _____unmetered public, _____
meter inaccuracies _____ I-Deed _____and non-I-Deed major leaks _____

f. Consideration use match to quality necessary (if, then must be with cross connection control program _____

8.04 (2) Available Water [Chapter 46-15.3-5.1 (f) of RI General laws]

Analyze ability to provide potable water:

- 5 & 20 year periods _____
- ID timing _____
- Quantity additional supplies _____
- Facilities required _____

a) General policies:

1) Determination of Safe yield of sources.
(using mass balance analysis) _____

2) Explain approach and provide analysis _____

- State reasons for utilizing said approach _____
- Document measures to safely manage risk _____
- Explain proposed procedures if beyond safe yield _____
- Greater than 5% not acceptable _____

3) Previous analyses on case by case basis _____

4) If operating under safe yield: (greater than 1%)

- Must undertake demand, supply, system and emergency mgmt measures _____
- Effectively reduce risk _____

5) Demand exceeds available water

- Initiate demand, supply and system management measures as appropriate _____

b. Determination of safe yield, $(SI - SO = S)$

Methodology for Safe Yield include at least:

1. Gauged streamflow data in watershed (or other which approx.) _____
2. Runoff related to stream gauge _____
3. Direct precipitation and evaporation (monthly) _____
4. Diversions (in & out) factored (existing & proposed) _____

5. Consumptive uses evaluated _____
6. Physical characteristics of reservoir(s) (sea level datum) _____
7. Reservoirs <150 MG storage/sq. mi.=short & long term droughts _____
8. Operating characteristics of reservoir described _____
9. Existing & proposed stream releases described _____
10. Leakage through dam _____
11. SY utilize sedimentation _____
12. SY out flow based on monthly draft rate _____
13. Critical drawdown measured from near full reservoir _____
- Multi-year full res. _____
14. Numerical or graphical method per items 12 this section OK _____

c. Methodology for determining:

- Maximum potential yield _____
- Maximum well capacity _____
- Well efficiency of existing groundwater supplies _____

Water suppliers should present:

- Summarized description _____
- Background documentation should not be included _____
- No additional fieldwork required _____

1. ID aquifer

- Location of wells _____
- Well fields _____
- Pertinent hydrologic/geologic info _____
- Scaled to need map _____

2. Description of production and observation wells

- Material _____
- Depth to bedrock _____
- Estimated thickness (if not available) then water table to well bottom _____
- Maximum drawdown level _____
- Date and results of aquifer tests or redevelopment _____
Including:
 - Name of entity conducting _____
 - Pump test rate(s) _____
 - Length of pump test _____
 - Final pumping level _____

- Specific capacity _____
 - Transmissivity _____
 - Difficulties in test _____
 - Date and results of quarterly specific capacity determination_____
 - Type and rated capacity _____
 - Duration _____
 - Static water level _____
 - Pumping water level _____
 - Well efficiency _____
- 3. Report maximum potential yield** _____
- 4. Describe any well limitations (physical or regulatory)** _____
- d. Identify limitations for using SY to estimate available water** _____
- 1. ID existing & future conditions compare available water to average maximum daily demand** _____
- Factor in water savings from supply-demand mgt. measures_____
 - ID additional supply if exceed - Include following: _____
 - Existing conditions _____
 - Future conditions 5 & 20 year _____

8.04(3) Alternative Supply [Chapter 46-15.3-5.1 (f) of RI General laws]

ID alternative available water supply sources

- Reactivation _____
- Potential interconnections _____
- Supply augmentation _____
- Joint use facilities or sources _____

Consider:

- General description necessary treatment _____
- Ability of existing treatment to improve raw water_____
- Capacity of pumping and distribution _____
- Measures to improve quality of source _____
- For source reactivation-necessary measures _____

8.04 (4) Supply Augmentation Studies [Chapter 46-15.3-5.1 (f) of RI General laws]

- Assess alternate water sources _____
- Reasons _____
- Ability to meet future demands _____
- Necessary construction _____
- Lands needed _____
- Water rights needed _____
- ID competing uses present-future _____
- Relationship to CCP's _____
- Financing _____
- Timing _____
- Life expectancy of facilities _____

- 1) If WS operating at a SY of 95% based upon a critical dry period with a probability of occurrence of 5% and unable to document operations at this risk level, they are to initiate supply augmentation studies _____
- 2) If all appropriate supply, demand, and system management measures have been implemented and the average daily demand for the most recent years equals or exceeds available water, as defined in section 8.04 (2) then supply augmentation studies shall be initiated. _____
- 3) If analysis of the ability to provide an adequate supply of potable water for the 5-year and 20-year period indicates the need for additional sources or facilities, then WS shall initiate supply augmentation studies. _____

8.05 Demand Management [Chapter 46-15.3-5.1 (d) of RI General laws]

Describe measures:

- To reduce demand for _____
- Effectuate efficient use of the states water resources. _____

{Include program to retrofit existing water users not in conformance with 1990 state plumbing code standards with water-saving plumbing equipment} _____

a) Residential Retrofit Program

- Describe steps necessary to establish and administer RRP _____

- E.g. hire consultants/staff _____
- Schedule of implementation _____
- Provide for the distribution of retrofit kits _____

1. Minimum RRP requirements:

- Annual notification of program objectives and achievements; _____
 - Water suppliers notify residential class user _____
 - Water efficiency devices _____
 - Installation services _____

2. Retrofit Kits

- Describe minimum contents of kit _____
- Investigate other water saving equipment _____
- Minimum standards _____

3. Implementation Schedule (10 yr.)

- Target 10% of residents annually _____

4. Retrofit Kit distribution

- Describe distribution method selected _____
- Target 10% of residents annually _____
- Acceptable methods include _____
 - Mail or direct delivery _____
 - Door-to-door _____
 - Messages on customer bills (toll free # to place orders) _____
 - Methods approved by WRB _____
- Publish reminders within 30-60 days _____

5. Public education and information

- Media campaign _____
 - Local schools and civic and other organizations _____

b) MUTAP - suppliers to provide technical assistance in;

- Performance of audits _____
- Formulation and implementation of sanitary device retrofit Programs _____

1. Minimum plan requirements;

- List of major users, _____
- Annual water uses _____
- Types use _____
- Steps to establish program _____
- Prioritized schedule _____

2. Cooperative agreements with owners or management is allowed _____

3. For major users - implementation description _____

4. Implementation schedule _____

c) Appropriate fees, rates and charges to reduce demand shall be utilized _____

8.06 System Management [Chapter 46-15.3-5.1 (e) of RI General laws]

Describe measures to insure:

- Proper operations _____
- Proper maintenance _____

Must state goal to:

- Minimize non-account water _____
- Achieve and maintain less than 15% _____
- Establish long term goal reduction to 10% _____

a) Measures to be described shall include:

- Meter Installation, _____
- Maintenance, _____
- Replacement plan _____

1) WS shall set forth a plan by which all water delivered shall be metered _____

2) WS shall effect a program for installation of remote reading systems

- Programs to be in place by July 1, 2001 _____

3) WS shall develop programs for recording metered usage and billing

- Programs to be in place by July 1, 2001

4) For major users, develop a schedule of:

- Maintenance and replacement of meters
- Testing and calibration schedule

5) Master meters tested once a year and calibrated as necessary

- Meter accuracy in conformance with;
 - AWWA standards
 - c700 series
 - AWWA
 - RI state plumbing code requirements
- AWWA not available
 - Demonstrate capability 95% - 105%
 - Tests shall be documented

b) Leak Detection and Repair (LDR) Plan: [Chapter 46-15.3-5.1(3)(a) of RI General Laws]

1) General policy:

- Plan and schedule
- Maintain non-account water 15%
- Conduct leak detection surveys

2) LDR plan:

- Describe leak detection methods

3) Comprehensive sonic leak detection and repair program

- Discuss;
 - # of leaks found
 - # fixed
 - Amount of water saved
 - Existing leakage rate (gallons per mile)

4) Discuss continuing maintenance program

- c) Preventive maintenance plan _____
- 1) Schedule for;
- Periodic inspection, _____
 - Maintenance, _____
 - Testing all critical components to AWWA standards _____
- 2) Accurate record keeping of;
- Inspections _____
 - Routine maintenance _____
- 3) Evaluation of records _____
- 4) Schedule and performance of corrective measures _____
- 5) Maintenance of spare parts inventory _____
- 6) Names and locations of manufacturers and distributors of critical components_____

8.07 Emergency Management [Chapter 46-15.3-5.1 (g) of RI General laws]

- Assess system risks and response capabilities _____
 - Describe a practicable contingency plan _____
- a) The plan shall:
- Identify natural and human caused risks - severity _____
 - Identify system risks (not routine) _____
- b) Identify critical components
- Emergency situations _____
- c) Estimate remaining capabilities
- Describe;
 - System storage capacities _____
 - Supply redundancy _____
 - Other contingency measures _____

d) Identify demands on the system

- Evaluate level of service sustained _____
- Identify major users _____
- Identify priority users _____
- Identify steps to reduce demand during emergency conditions _____

e) Identify personnel responsible for actions and any training needs _____

f) For emergency situations describe;

- Notification procedures _____
- Means of implementation _____

Plan shall include notification of:

- Personnel _____
- State officials _____
- Local officials _____
- Media _____
- Public _____
- Users _____

g) Inventory of:

- Emergency equipment _____
- Stand by equipment _____
- Critical spare parts _____
- Supplies _____
- Procedures for above _____

Identify:

- Additional equipment _____
- Parts _____
- Supply needs _____
- Procedures for obtaining additional equipment _____
- Procedures for loaning available equipment _____
- Stand by power _____
- Electrical outage _____
- Interagency agreements shall be documented _____

h) Identify sources of emergency water supply within service area _____

- Identify legal, technical and financial requirements _____

Include:

- Schedule for activation _____
- Periodic testing _____
- Available yield _____
- Quality _____
- Agreements with other water suppliers _____

i) May address steps to treat contaminated sources _____

j) Specify water supply emergency responses _____

Identify:

- Critical indicators _____
- Extent of facility damage _____
- Triggers _____

k) Outline steps for recovery _____

- Describe when steps will be activated _____

l) Outline;

- Cost estimates for immediate actions _____
- Expenditures to eliminate vulnerabilities _____
- Pricing of specific emergency response procedures _____
- Availability of resources for implementing of Emergency Mgt. _____

m) Describe relationship of emergency plan with other local or state plans _____

8.08 Implementation Schedule, Responsible Ethics, and Projected Costs

[Chapter 46-15.3-5.1 (i) of RI General laws]

a) For any action taken designate;

- Persons or organizations responsible _____
- Others who participate _____
- Time period _____

b) For each action taken, estimate costs for;

- Capital _____
- Operating _____
- Maintenance _____

8.09 Financial Management [Chapter 46-15.3-5.1 (i) of RI General laws]

a) General guidelines

- 1) Declining block rates discouraged _____
- 2) Operate in a financially self-supporting manner
 - Reasonable profit allowed (PUC) _____
 - Intergovernmental service charges shall be fair _____
- 3) Identify anticipated sources of funds to implement WSSM plan _____
 - Charges limited for plan requirements _____

b) Describe current financial management practices and status _____

- 1) Include in spreadsheet format:
 - Summary of income and expenses - 3 years _____
 - Operating income _____
 - Annual water rate revenue _____
 - General facility charge revenue _____
 - Special assessment revenue _____
 - Reserve fund revenues _____
 - Other earned or unearned revenue _____

- Operating Expenses;
 - Annual indebtedness _____
 - Debt service on bonds _____
 - Operations _____
 - Maintenance _____
 - Facility replacement funds _____
 - Appropriations for major improvements _____

- Other appropriate expenses _____
- Grants, loans, income from bond sales _____

2) Describe existing rate structures _____

3) Describe frequency of billing and collection procedures and policies _____

c) Future revenue sources:

- List _____
- Discuss _____
- For system improvements and programs within 5 years :
 - Plan of preparation should be prepared describing; _____
 - Basic revenue requirements _____
 - Maintenance _____
 - Improvements _____
 - Ability to secure revenue _____
 - Assumptions regarding inflation rates, rates _____
 - charge and grant eligibility _____

d) Assessment of rates:

Include necessary changes in rate structure for future improvement _____

The following factors should be considered:

- Recovery of all capital and operating costs _____
- Marginal cost pricing _____
- Emergency and drought period surcharges _____
- Seasonal price structures _____
- Difference in costs based on points of delivery _____
- Effect of fees - on wastewater costs and charges _____
- Effect of reducing non-account water - stated goals _____
- Costs of preparing, maintaining, and implementing WSM programs _____

e) Billing:

- Bills rendered on regular schedule _____
- For joint billing discuss cooperative initiatives _____
- Evaluate arrangements with municipalities _____

8.10 Coordination [Chapter 46-15.3-5.1 (h) of RI General laws]

- a) WSSM plans shall;
 - Be coordinated and consistent with local comprehensive plans _____
 - Integrated with municipality plans _____
 - Describe efforts to coordinate _____
 - Focus on existing and future land uses, zoning, growth _____
- b) Describe efforts to coordinate with other water suppliers _____
- c) Describe efforts to coordinate with wastewater treatment facilities _____

8.11 RIGIS [Chapter 46-15.3-5.1 (c) of RI General laws]

- a) All geographic data should be in a form that is able to be transferred directly into RIGIS
 - Data mapped to USGS standards _____

9.00 Data collection Requirements [Chapter 46-15.3-5.1 (c) of RI General laws]

9.01 Reporting Requirements [Chapter 46-15.3-5.1 (c) of RI General laws]

- Interim report no later than 30 months from approval date of WSSMP. _____
- Any DEM 30 month date shall be reevaluated _____
- Amendments may be submitted anytime _____

The 30-month reports shall include:

- Updated water system data _____
- Status of plan implementation _____
- Describe progress of specific milestones _____
- Tasks outlined in approved plan _____

The 30-month reports shall include:

- Metered water production of each source on monthly basis _____
- Metered water purchased from WS by interconnection on monthly basis _____
- Estimate of population served _____
- Number of service connections _____
- Total metered retail water sales on annual basis _____
- Metered retail water sales by user category on an annual basis _____
- Metered wholesale water sales by interconnection on a monthly basis _____
- Estimated volume of water used for fire fighting on annual basis _____
- Estimated volume of non-account water on an annual basis _____

10.00 Plan Submittal [Chapter 46-15.3-7.5 of RI General laws]

10.01 Time Schedule for Plan Submittal

- a) Plan shall be filed by date determined by WRB _____
- b) If exceed 50 million gallons you must file _____

Threshold determination (from DOH)